

## Humanity and Divinity as Radically Embodied

by David Nikkel

This article appeared in *The Global Spiral*, Oct. 2006, vol. 6, Issue 11

According to the etymology of “Adam,” the Hebrew word for “humanity,” when God created human beings in Genesis 2 God shaped “the earth being.” The portrait of painted by the scriptures of Judaism, Christianity, and Islam regards the human person as a psycho-somatic unity. Scientific evidence increasingly points to the truth that human beings are fundamentally embodied in nature, contrary to the Greek-influenced mind-body dualism that has reigned for most of Western theological and philosophical history. In this paper I will develop a biologically informed theory of anthropology—of human nature, rationality, and meaning—that I label “radical embodiment.” In doing so I stand—to use a bodily metaphor—in a tradition begun by a mentor, religionist William H. Poteat, who drew upon certain bodily minded scholars, especially phenomenologist philosopher Maurice Merleau-Ponty, philosopher of language Ludwig Wittgenstein, and philosopher of science and epistemologist Michael Polanyi. The underlying and overarching contention of radical embodiment is that all human reason, meaning, and consciousness arise, not merely instrumentally but substantively from our sensorimotor capabilities and from the feeling and orientational states of our bodies. Etymologically “radical” means getting to the roots of something. Our bodies comprise the very roots of all our being and doing. Of course we humans can quite proficiently ignore or deny the pervasiveness of our bodily nature, because our awareness of our bodies and the bodily meanings of our actions is usually tacit, subconscious, or unconscious. But the radicality of my claim is that finally nothing about our humanity makes sense apart from our embodiment in the world.

The radicalness of Western dualism in the wake of Descartes aroused Merleau-Ponty. In his Phenomenology of Perception and other works, he delineated the horns of the dualistic dilemma: either rationalism held sway and in the final analysis the human mind imposed its internal structure and meaning on the world, or empiricism ruled and human perception simply mirrored the order and meaning of the external world. The picture that controlled both sides of the debate assumed that reality was determinate—already fully specified either in our minds or by the environment—quite apart from our bodily engagement with the world. It was this discarnate picture that Merleau-Ponty doggedly attacked with thick descriptions of scientific experiments and of both ordinary and extraordinary examples of human and animal perception. The touchstone running through Merleau-Ponty’s corpus (pun not intended though noticed) is this: every human perception—and by extension every human act of reflection—involves a correlation of 1) our attention and our embodied effort to make sense of the world and 2) input and givenness from the world. This correlation is radical; it is a surd behind which we cannot venture. There simply is no pure subject or mind apart from our embodiment in an environment nor a pure object in itself apart from its relation to other realities. As Merleau-Ponty concludes after considering the case of a brain-injured man’s deficiencies in perceptual knowledge:

Consciousness is being towards the thing through the intermediary of the body. A movement is learned when the body has understood it, that is, when it

has incorporated it into its “world”, and to move one’s body is to aim at things through it; it is to allow oneself to respond to their call, which is made upon it independently of any representation. (138-39).

And as he writes of “the cogito” near the end of the work:

There is vision only through anticipation and intention, and since no intention could be a true intention if the object towards which it tends were given to it ready made and with no motivation, it is true that all vision assumes in the last resort, at the core of subjectivity, a total project or logic of the world which empirical perceptions endow with specific form, but to which they cannot give rise. (404-05).

For Merleau-Ponty then the world has a structure, a logic, whether we exist to experience it or not. But he deliberately distinguishes between the “thing” that “calls” to us to help in the project of its definition versus “the object” which is supposedly—but in reality never can be—fully constituted apart from our bodily engagement. Nor conversely is the self “aware of itself as absolutely transparent, and as the originator of its own presence in the visible world.” (405).

One can find analogues to this principle of the partial openness of objects to determinateness by another in realms and processes of physics that are presumably independent of any consciousness: 1) on the subatomic quantum level, in keeping with Heisenberg’s uncertainty principle, particles and energy appear to inhabit certain probability ranges unless and until they are measured or otherwise come into contact with another physical reality 2) Einstein’s theories of relativity entail that the temporal interval between events depends on the relative speeds of frames of reference—there is no absolute space or time fully constituted apart from the event or encounter. Note that the openness is only partial: the potential quantum states fall within boundaries and whether a given event is subsequent or consequent to another does not change for any frame of reference. We might hypothesize a general principle: each physical reality has a certain “for-itselfness,” that is, an integrity that “pushes back” relative to other realities, even as it is partially constituted by other realities. Theologian Paul Tillich had a similar intuition when he wrote that every reality resists being “treated as a mere thing, as an object which has no subjectivity.” (1:173)

Whiteheadian process philosophy for its part claims the “unit occasion of experience” as the basic unit of actuality. This metaphor or concept, however, seems to privilege the subjective/mind side over the objective/physical. The object is (reduced to) an earlier subjective experience that is only partially “prehended” by a present subject. Subject and object become the same in essence and any distinction between them becomes just a matter of time and perspective.

But for radical embodiment subjectivity and objectivity are correlative simultaneously. Each reality has/is both “inside” and “outside” in relation to other realities, with the degree of emphasis on internality versus externality relative to context. As Merleau-Ponty avers, “Inside and outside are inseparable.” (407). The contextuality of inside/outside plays out with respect to the body itself. When I look at my arm it is relatively external compared to when I reach for a bowl of food with it. When I think about the synapses that occur in my brain as I type this sentence, my brain becomes very objectified, external, “third-person,” and abstract in comparison to my subjective experience of the meaning of the sentence. Indeed, I can never in truth get wholly

outside my phenomenal or experiencing body in any absolute or concrete sense. It is the surd I cannot penetrate into any further nor extract myself from. Conversely, when a blind person walks with a cane or when I drive a car, the cane and car become internalized extensions of the body rather than external objects to which one attends.

To play a bit more with the mutual defining of human or animal and environment in the case of perception, we can consider effects on or alterations to the environment. When one comes in contact with an object tactilely the effect is tangible and obvious. However, in the more subtle cases of vision and hearing, effects also occur. Certain light waves and sound waves are stopped or captured by the body and its organs of perception and are processed in varying ways depending upon which organism we consider (while other waves are reflected or refracted). Thinking about how different animals engage their environment in perception and movement sets the stage for our next topic.

In their book, *The Embodied Mind*, cognitive scientists Francisco Varela, Evan Thompson, and Eleanor Rosch, with support from biologists Lewontin and Oyama, deftly extend the theory of the correlation of sensorimotor capabilities and the environment. That a perceiving/acting subject and the world mutually define or determine each other applies to the evolutionary process. Here the concept of organism as self-organizing and emergent biological system is crucial, as evolving organisms and environment mutually specify each other. The label that the three affix to their theory of evolution is “natural drift.” A self-organizing biological dynamic system has an integrity that puts pressure on the environment, so to speak, even as the environment puts pressure on it. This notion dissents from the dominant neo-Darwinian concept of optimal fit. This latter notion lays all the influence, all the causative power, on the side of the environment: the environment defines the organism but the organism exercises no effective specification upon the environment. We might observe that relative to Cartesian dualisms, optimal fit opts only for the objectivist and empiricist side in reductionist fashion. Varela and company note various difficulties with standard neo-Darwinian theory (180ff). Pleiotropy is the linkage of genetic traits. Optimal fit however should work against pleiotropy: maximal independence of traits would provide maximal flexibility to adapt to each environmental change. Relative stability of species over time also creates problems for optimal fit. Exemplars of such stability include the stasis of certain species—species that remain unchanged through eons of tremendous environmental change—as well as the phenomenon of punctuated equilibrium. This latter concept points to the evolutionary record of major changes coming only after a “critical mass” of environmental change causes a tipping point. The all-pervasive influence posited by optimal fit does not fit well, though, with punctuated equilibrium: rather one would expect ongoing gradual changes corresponding to ongoing changes in the environment (as well as major changes in periods of sudden, climactic shifts).

As an alternative to optimal fit, natural drift proffers adequate fit. Biological organisms, as self-organizing systems, have their own integrity that pushes back against and partially determines the environment. Therefore, the evolutionary adaptive requirement is the less stringent one of adequacy, rather than that of optimal bending to each and every environmental modification. As Varela and crew put it, “The environment of course puts constraints or pressures on ‘viable trajectories,’ but at the same time the organism’s perception, motor, and cognitive capabilities partially create its world, its environment.” (185ff). As with individual cases of movement and perception

mentioned above, we may first think of very tangible ways that a species modifies its environment, such as beavers building dams, various mammals digging tunnels and burrows, and birds constructing nests. On this score, we modern human beings through culture have so modified our environment that we have inured ourselves to many of the usual evolutionary pressures, while with the same stroke we have put unusual environmental pressures on countless other species. Less obviously species also find—and create—their niches by the unique ways their perceptual organs are structured. Self-organizing organisms select (partially but really) which input from the environment to attend to, even as the environment is also doing real “natural selection.” So bats specify their environment by attending to sound waves in their manner, indeed producing the sound waves they perceive in correlation to their environment. Animal species specify their worlds visually in differing ways: the three kinds of cones we humans possess make us tripartite in our color vision; however, some other species have two, four, and perhaps even five types of cones (Varela *et al*:181-82). Thus different species attend to differing frequencies of electromagnetic radiation in diverse ways. The bottom line is this: the self-organizing and emergent capabilities of biological networks mutually or correlatively specify and evolve with an environment.

The evolutionary changes alluded to above involving symbolic communication and culture have enabled humankind to step back from our more or less immediate environment to entertain two kinds of questions apparently unique to our species—those of religion and those of science. These endeavors allow us to find—and partially create—micro, macro, and transcendent worlds “below” and “above” those of ordinary perception. Science and religion, while arguably the most far-reaching, represent just two of many ways that language has exponentially expanded the complexity of human reason and meaning. Nevertheless, consonant with our evolutionary heritage and our self-organizing capabilities as biological organisms, radical embodiment argues with Poteat, Merleau-Ponty, Wittgenstein, and contemporaries philosopher Mark Johnson and linguist George Lakoff, that the semantics of all human language relies inescapably, radically upon the images and meanings of our spatial orientation, movement, perception, and bodily feelings. Johnson and Lakoff hypothesize that at the base of human language lie bodily schemas. Most of these basic schemas are spatial orientational and perceptual, such as the container schema (in-out), the source-path-goal schema (from-to), part-whole, up-down, left-right, and near-far. Back in the 1920’s H. Head’s studies of brain-traumatized patients demonstrated inabilities to conceptualize and symbolize when primary motor areas of the brain had been damaged. It is no coincidence that Merleau-Ponty cites Head. Merleau-Ponty’s perspective on the body and language comes through in the following passage:

The word ‘sleet’, when it is known to me, is not an object which I recognize through any identificatory synthesis, but a certain use made of my phonatory equipment, a certain modulation of my body as a being in the world. Its generality is not that of the idea, but that of a behavioural style ‘understood’ by my body in so far as the latter is a behaviour-producing power, in this case a phoneme-producing one. One day I ‘caught on’ to the word ‘sleet’, much as one imitates a gesture, not, that is, by analysing it and performing an articulatory or phonetic action corresponding to each part of the word as heard, but by hearing it as a single modulation of the world of sound, and

because this acoustic entity presents itself as ‘something to pronounce’ in virtue of the all-embracing correspondence existing between my perceptual potentialities and my motor ones, which are elements of my indivisible and open existence. The word has never been inspected, analyzed, known, and constituted, but caught and taken up by a power of speech and, in the last analysis, by a motor power given to me along with the first experience I have of my body and its perceptual and practical fields. (403).

But what of the more abstract, indeed the most abstract of human language, such as higher mathematics or theology? Must even this rely substantively upon bodily schemas? Radical embodiment unequivocally answers “yes.” Johnson and Lakoff hypothesize that subjective abstract language relies upon emotive source domains going back to early childhood. At first young children may conflate something from a source domain with the target domain. For example, the warmth of being held might be conflated with the personality of a minister. Before long, though, the child is able to distinguish between source and target domains. Yet throughout life we cannot understand the meaning of the more general and abstract target domains except through their connection with the emotive source domain. Beyond such feeling-orientated language, Lakoff and Johnson maintain that all abstract language extends metaphorically and metonymically from embodied schemas. Here we venture into the syntax of human language, which permits us to do all the manipulations and permutations of scientific, religious, and other complex forms of thought. Lakoff contends that syntax itself relies upon basic bodily schemas: for example, hierarchical structure stems from part-whole and up-down schemas, head and modifier structures from link schemas, and categories from container (in-out) schemas (289ff). Interestingly, psychologist Harry Hunt cites experiments that demonstrate that the syntactical structure of many sentences correlates with the typical gestures accompanying human speech, externalizing syntax’s implicit spatial design (154-56).

To apply this principle of the embodied basis to religion, we might analyze the key theological concepts of transcendence and immanence. The meanings of these terms rely upon our bodily perceptual grasp of such orientational schemas as “in-out” and “near-far.” These constitute not merely optional metaphors for something we could know more directly; without them concepts of transcendence and immanence are literally inconceivable.

To conclude then this subsection on abstract language, even the syntax that informs the most abstract of mental gymnastics relies upon and extends from bodily semantics. And to conclude this whole section on language and the body, I will quote a succinct and cogent phrase from Poteat:

... language—our first formal system—has the sinews of our bodies which had them first; the grammar, syntax, meaning, semantic and metaphorical intentionality of our language are preformed in that of our prelingual mindbodily being in the world which is their condition. (1985:9).

In the area of neurobiology, Nobel Laureate Gerald Edelman and best-selling author Antonio Damasio have advanced embodied-biological models of mind, arguing that body-minded consciousness entailing intrinsic values has been evolutionarily adaptive. For both, consciousness arises from mappings in the brain of the body, involving both spatial orientation and feeling, and of the environment in correlation.

These neural patterns then correlate to conscious “images” or “representations.” Note that neither uses “representation” in a Cartesian manner, that is, as a repetition or mimicking of an already fully constituted physical or mental reality. Instead their theory traverses the same wave-length as Merleau-Ponty and Varela. As Damasio pens: “Rather than mirroring the environment around it, as an engineered information-processing device would, each brain constructs maps of the environment using its own parameters and internal design, and thus creates a world unique to the class of beings comparably designed.” (1999:322).

Both contrast their model with functionalist computational models. Historically computational models have been discarnate, plying the mind side of Cartesian dualism. Edelman and Damasio’s harshest words target serial Turing machine models, from what Johnson and Lakoff have labeled “first-generation” cognitive science (75ff). Such computational models represent the purest form of functionalism, where hardware, material, and structure matter not at all, subordinated to the final product of the software program. And they are antithetical to the actual structure and working of the human or animal mind. Second-generation connectionist models come closer to imitating the structure of living minds. In and of themselves, however, they are still discarnate. And as Edelman stipulates, they are not necessarily “selectional,” where the computer makes selections and learns based on its values (1992:226-27). Edelman’s critique points to a more fundamental problem with computational models, even embodied ones like the Massachusetts Institute of Technology’s Cog project. A biological model entails the intrinsic values of a self-organizing system. While a computational embodied model like Cog has some self-organizing properties, it clearly can make no claim to be fully self-organizing. The external programmer has made a major intervention in its very existence. The external programmer also determines its basic values.

Gregory Peterson, in his fine work Minding God: Theology and the Cognitive Sciences, labels Edelman and Damasio’s approaches as functionalist (57). In response to my paper for a panel on his book, he also states that their biological approach is not only functionalist (in that it involves matter structured and sequenced in a certain way) but likely also computational, in that the brain’s processes probably can be simulated on a Turing machine. Of course, I do not deny that the brain processes information. But that fact in and of itself does not get us very far. Many non-conscious biological and non-biological, as well as conscious biological, systems process information. At least if we accept William James’ characterization of even mystical states as noetic, all conscious states probably involve some kind of cognition. The important question concerns the nature of the information processing.

A first crucial point is that human beings are living organisms—breathing, motile, eating, sexual organisms, not primarily knowers or information processors. As suggested just above, an embodied-biological model differs from functional or computational models due to the intrinsic values of a self-organizing system. Organisms do not just process information, they specifically process information according to biological values. To refer to the “for-itselfness” or proto-subjectivity of any reality mentioned above, biological systems take this to a new level with their emergent properties. Ursula Goodenough and Terrence W. Deacon speak of biological systems in terms of “third-order emergence”: “genetic and epigenetic instructions place constraints on second-order systems and thereby specify particular outcomes called biological traits.” (820). That we

refer to an organism as self-organizing points to an integrity or integration, a for-itselfness, that allows us to recognize its values. As Goodenough and Deacon put it: “third-order emergence defines the onset of telos on this planet and, for all we know, in the universe. Creatures have a purpose, and their traits are for that purpose.” (821). By contrast a strictly computational model cannot recognize the inherent values of an organism because the organism’s symbolic or semiotic activities must be reduced to uninterpreted and uninterpretable cause and effect. This points to a key principle of biological systems and their emergent properties that computational models fail to account for: the whole is different—and more in terms of complexity—than the sum of its parts. That is, the self-organizing whole has new properties that the parts individually do not possess. This principle constitutes one reason I doubt that biological information is simulatable on a Turing machine, for the latter’s serial processing appears to reduce the whole to the “linear” sum of the parts, to the neglect of global properties.

The second crucial point is that human beings, along with many animals, are conscious living organisms. I take consciousness itself to be an emergent property of some self-organizing biological systems. It is no supernatural ghost but is an integrated property, new and different in comparison to the individual properties of its component processes, far more than just a linear sum of these components. One analogy I offer for the plausibility of this interpretation is the difference in the make-up of the nuclei of adjacent elements in the periodic table: adding one proton results in tremendous change in the physical properties of an element, rather than in the augmentation of previous properties in some linear fashion. I would speculate that the interchange of electrical charges serves as a significant factor in the emergence of consciousness. On the other hand, this biological-embodied model offers continuity between non-conscious and conscious organisms. Consciousness is the becoming aware of values or interests, such as nourishment and hydration, which non-conscious organisms possess. (Indeed, the reason we intuitively recognize the purposes of non-conscious organisms is because we consciously experience them in ourselves.)

Both Edelman and Damasio envision a central role for values as manifested in emotions and feelings in the evolutionary emergence of consciousness. Damasio is especially captured by feelings, with all three of his book titles referring to them. For Damasio, background feelings of our body states are key to the core consciousness of animals and humans. Core consciousness is the nonverbal sense of self that at least all mammals possess (which Damasio distinguishes from the self-consciousness that humans attain through language—Edelman uses the parallel terms “primary” and “higher-order” consciousness). More specifically Damasio theorizes that these background feelings contribute to consciousness in their role as “primordial representations of the body” which “provide a core for the neural representation of self” (1994:235ff; see also, 1999:37, 110, 285-87). Adds Damasio, background feelings frame “the feeling of life itself, the sense of being” (1994:150). In contrast to an embodied-biological model, the discarnate tendencies of computational models that ply the mind-side of dualism show forth further by plying one side of an emotion/reason split. Such models emphasize “information” and knowledge to the neglect of conscious values, or feelings.

Damasio’s negative comments on the possibility of a conscious artifact further convey the difference between a computational model and the intrinsic values inherent to self-organizing subjectivity in a biological model:

(T)he artifact's internal states may even mimic some of the neural and mental designs I propose here as a basis for consciousness. They would have a way of generating second-order knowledge, but without the help of the nonverbal vocabulary of feeling, the knowledge would not be expressed in the manner we encounter in humans and is probably present in so many living species. Feeling is, in effect, the barrier, because the realization of human consciousness may require the existence of feelings. The "looks" of emotion can be simulated, but what feelings feel like cannot be duplicated in silicon. Feelings cannot be duplicated unless flesh is duplicated, unless the brain's actions on flesh are duplicated, unless the brain's sensing of flesh after it has been acted upon by the brain is duplicated. (1999:314-15).

To further delineate radical embodiment's version of a biological model of consciousness, I will tweak some of the language often associated with emergence: "weak emergence" will refer to consciousness as an emergent property without any causal effectiveness. That is to say that only the neural substrate or correlate exercises—quite apart from the qualia of consciousness—any causal function or effectiveness. Consciousness, so to speak, just comes along for the ride and has at least no utilitarian function. Interestingly enough Edelman claims this position in his latest book, Wider Than the Sky, assuming it represents the only view compatible with the closed system of cause and effect to which he subscribes. I will refer to the next option as "closed strong emergence." This holds that consciousness is an emergent property with tangible causal effects but that its causal effects are in every way inseparable from (though not reducible to) its component parts. That is to say that the total causal effects of the parts and the emergent whole are a package. If the causal properties of the parts could be isolated and engaged apart from causal properties of the emergent whole, they would be less complex and less efficacious. However, on this view they cannot. Therefore, as a closed system each state of consciousness and neural substrate in conjunction with the environment determines the subsequent state. This I take to be the view of Jaegwon Kim. Based on his contortions in Wider Than the Sky, I also judge this as the option most compatible with the trajectory of Edelman's thinking. For he describes consciousness as an entailed property of the neural substrate and as a property that apparently makes a difference in the world. Specifically the evolutionary adaptiveness of consciousness is probably its communication of information about the neural substrate to the organism and to other organisms, which would not happen otherwise (76ff).

I will push the envelope and endorse a third option (one that at least Damasio does not rule out): open strong emergence. Here consciousness as emergent property exercises a measure of independent causal effectiveness, the power of some indeterminate free will. Of course, consciousness always depends on its component neural correlates for its very existence. On this model, however, a given neural substrate and its attendant consciousness may be compatible with more than one subsequent state, with the emergent property of consciousness tipping the balance, a case of "top-down" causation.

Physical reductionist models of consciousness oppose radical embodiment from the objectivist-empiricist side of Cartesian dualism. (Note that scholars may ply both this side and the idealist computational side in different aspects of their thought.) Technically



such a reductionist rejects the very idea of emergence. However, a weak emergentist who disclaims any value—even serendipitous or coincidental—to consciousness falls into the same camp. Consciousness here loses its integral connection to our bodily engagement with our natural and social worlds. Instead, consciousness becomes an epiphenomenon or illusion. Patently this model alienates us from our bodies and our embodiment in the world. Natural selection implicitly or explicitly becomes an external programmer that tricks us. As it were, natural selection and the reductively physical fool the animal into cooperating with biological process conducive to survival through illusory values or pleasures. Note how in this model the external environment totally specifies or determines the organism; this model misses the mutual specification or partial self-determination by the conscious organism according to its intrinsic values. Various commentators have spotted an incongruity in the hypothesis of consciousness as epiphenomenal: despite its illusory character nature has selected consciousness.

Related to the epiphenomenal question is the degree of integration or lack thereof in consciousness, whether the common-sense view of an integrated self is itself an illusion. Rodney Brooks, the chief architect of Cog, portrays a connectionist robot as the model for animal consciousness: “Out of the local chaos of” the “interactions” of the activities of the various “layers,” “in the eye of the observers, a coherent pattern of behavior emerges”—but only in the eyes of the observers (Brooks quoted in Varela *et al*). Varela and company, committed to a Buddhist metaphysics of no-self (anatman), also take the notion of an integrated self to be illusion. Thomas Metzinger argues from cases of psychopathology, including schizophrenics who look at themselves in the mirror and exclaim, “I do not exist,” that we superimpose a sense of (a non-existent) self (Apple).

Against the above claims, I will argue for the reality of a conscious integrated self from the perspective of radical embodiment. Clearly I do not support a unitary self—which would be the type of self we might expect if the mind were a central processing Turing machine. Rather I contend that connectionist biological consciousness is sufficiently integrated to warrant speaking of a self. Though of course it does not decide the issue, I would first of all point to the very term “self-organizing” systems. We intuitively assume a sufficient degree of integration that we use the term “self” for non-conscious biological and even non-biological natural systems. Furthermore, those who think of natural selection as fooling consciousness assume an integrated biological organism with interests (like eating and reproduction) served by such trickery. Even those who carry out the logic of epiphenomenalism to its conclusion—that there is nothing even to be tricked—cannot, and to my knowledge do not, deny that biological organisms possess the integration of homeostatic and metabolic interests. Finally, while much of Damasio’s research has involved brain-damaged subjects, I judge his interpretative approach to be more fruitful than Metzinger’s: rather than taking pathology as indicative of the true nature of normal states, Damasio uses pathological cases to ascertain what they lack in comparison to our normal consciousness of self. For example, Damasio learns from agnosognosiacs, victims of left-side paralysis with only an external knowledge of their condition, unable to experience background feelings, unable to sense their current body state. While their retention of linguistic ability allows them an outdated understanding of their identity, they report irrationally on current motor defects and evidence no affect or concern about the state of their health. As Damasio concludes,

“these patients’ self, unable to plot current body signals on the ground reference of the body, is no longer integral” (1994:154-55).

Michael Polanyi’s concept of tacit knowledge is helpful in fathoming both why reductionist “solutions” to the first person-third person problem are misguided and why we humans so readily come up with discarnate models of human nature, whether functionalist, computationalist, linguistic constructivist, or reductive physicalist. For Polanyi most of our knowing is tacit. First-person knowing always involves subsidiary or tacit elements, in the first instance elements of our body in interaction with the world, which we subconsciously rely upon as we focus upon a particular meaning or goal. Recall the example of a blind person walking with a cane. When he or she first learns to walk like that, one attends to the tactile sensations of one’s hand. But soon one’s focal awareness turns to navigating one’s world; the hand’s sensations have become tacit. Whether we talk of our “original” bodies or the extensions of our bodies represented in tools and language, we indwell the bodily meaning of our perceptions and movements, our speech, and our subconscious and unconscious brain processes even as we attend to our world.

By way of contrast Paul Churchland represents the reductionist rejection of first-person subjectivity. According to Churchland those who claim something more or different for first-person versus third-person knowledge confuse knowledge with perspective, thus committing a category error (195-208). So for Churchland the external observer with full knowledge of the functioning of an organism’s brain would possess all the knowledge that the organism possesses. From a Polanyian perspective, though, the reductionist commits the category error. The error results from failure to notice that third-person knowledge makes focal or explicit what is tacit for the organism, thereby changing its meaning, its very character. An everyday example occurs when one focuses on the sound of a word by repeating it; the word becomes strange to our ears as its contextual meaning evaporates. In this manner “(s)ubsidiary awareness and focal awareness are mutually exclusive” (Polanyi, 56). Therefore, contra Churchland first-person knowledge is not the same knowledge as third-person, only from a different perspective. Once again reductionism fails to see that the whole is more or different than the sum of the parts. We might say that in purportedly explicitizing tacit knowledge, reductionism linearizes or sequentializes the global meanings inherent in self-organizing systems, in this case the holistic meanings inherent in embodied-biological consciousness. A thought experiment by Edelman offers backing for a Polanyian perspective: Imagine a homuncloid inside a person’s brain who comprehends all the representational activities of its neural substrate. Edelman concludes that because the homuncloid “does not have the animal’s body,” it “cannot fully recapture the content of that privacy” (2004:74-75)—in Polanyi’s language the homuncloid cannot indwell that body.

Polanyi’s notion of tacit knowledge helps us understand why some models of consciousness go astray. Since the bodily nature of all we do, know, and think is usually tacit, it becomes easy to forget or ignore our inalienable bodily indwelling in favor of discarnate models that deny our lived and lively phenomenal bodies. Radical embodiment offers a way to avoid the discarnate and dualistic tendencies of computational or reductionist models of consciousness: mind and body are intrinsically integrated, for certain self-organizing animal and human bodies arrive together with

embodied consciousness in the course of evolution. Embodied minds belong in this world and we earth beings can normally feel at home here.

Whether human meaning and the purposes of all self-organizing biological systems are here on purpose or ultimately by blind chance or brute fact goes beyond the ken of science per se into the realm of metaphysical intuition or religious faith. My intuition that self-organizing biological systems point to a purposive higher power is not provable (nor disprovable) by science; it is not even something which science can with legitimacy directly address. However, the science and religion dialogue can help us to avoid those models of divinity incompatible with, and to opt instead for those that cohere or even resonate with, scientific knowledge. In speaking of God as radically embodied and of the world as the body of God, we must recognize the metaphorical nature of all language about ultimate reality; we must recognize both the “is” and the “is not” of the simile. Such bodily metaphor should not imply a divine brain or nervous system. More broadly it should not mean that God’s existence depends on the world the way our consciousness depends on our brain and body for its very existence. The affirmative side of the metaphor emphasizes that as the emergent whole of a self-organizing system includes various components without being reducible to it, so in a suitable sense God includes the world while transcending it. To spell out the logic a bit more, as human personality is not simply reducible to its component physical processes, so the divine personality is not exhausted by its intimate relation to the world. To speak more conceptually and less obviously metaphorically, I urge a panentheistic model—noting though that this “all in God” model itself metaphorically relies upon and extends from our bodily grasping of the container or “in-out” and part-whole schemas. But unlike some self-declared panentheists I embrace the body of God metaphor because it presses the profound intimacy of the divine-world relationship, because it urges that what happens in the universe matters deeply to God. To return to the negative side of the metaphor, God’s radical embodiment does not for me deny that God can be embodied in other universes or that some aspects of the divine life totally transcend embodiment in any world. God’s radical embodiment does entail that what knowledge we have of the divine arises from divine embodiment in our world. And it does align our vision of God with our emerging vision of human meaning as radically embodied. We can enlist the bodily metaphors at the root of all our experience to help us fathom ultimate reality as we interpret the natural world as the body of God.

## REFERENCES

- Apple, James. 2004. "Mind as Representational Analysis: Bridging First and Third Person Accounts." Paper presented to the American Academy of Religion Annual Meeting, San Antonio, TX.
- Brooks, Rodney A. 1991. "Intelligence without Representation." Journal of Artificial Intelligence: 139-59.
- Churchland, Paul M. 1995. The Engine of Reason, the Seat of the Soul: A Philosophical Journey into the Brain. Cambridge, MA: MIT Press.
- Damasio, Antonio. 1994. Descartes' Error: Emotion, Reason, and the Human Brain. New York: G. P. Putnam's Sons.
- . 1999. The Feeling of What Happens. New York: Harcourt Brace & Co.
- . 2003. Looking for Spinoza: Joy, Sorrow, and the Feeling Brain. New York: Harcourt Brace & Co.
- Edelman, Gerald. 1989. The Remembered Present: A Biological Theory of Consciousness. New York: Basic Books.
- . 1992. Bright Air, Brilliant Fire: On the Matter of the Mind. New York: Harper Collins.
- . 2004. Wider Than the Sky: The Phenomenal Gift of Consciousness. New Haven, CT: Yale University Press.
- Goodenough, Ursula and Terrence W. Deacon. 2003. "From Biology to Consciousness to Morality." Zygon: Journal of Religion and Science 38-4:801-819.
- Head, H. 1920. Studies in Neurology, vol. 2. London: Hodder & Stoughton.
- Hunt, Harry T. 1995. On the Nature of Consciousness: Cognitive, Phenomenological, and Transpersonal Perspectives. New Haven, CT: Yale University Press.
- James, William, 1902. The Varieties of Religious Experience. New York: Modern Library.
- Johnson, Mark and George Lakoff. 1999. Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought. Chicago: University of Chicago Press.

- Lakoff, George. 1987. Women, Fire, and Dangerous Things: What Categories Reveal about the Mind. Chicago: University of Chicago Press.
- Kim, Jaegwon. 1993. Supervenience and Mind: Selected Philosophical Essays. Cambridge: Cambridge University Press.
- Merleau-Ponty, Maurice. 1962. Phenomenology and Perception, trans. George Van Den Abeele. Minneapolis: University of Minnesota Press.
- Metzinger, Thomas. 2004. Being No One: The Self-Model Theory of Subjectivity. Cambridge, MA: Bradford Books.
- MIT humanoid-robotics-group. 2004. "Overview." At <http://www.ai.mit.edu/projects/humanoid-robotics-group>.
- Peterson, Gregory R. 2003a. Minding God: Theology and the Cognitive Sciences. Minneapolis: Fortress Press.
- . 2003b. "Minding God Symposium: A Response." Presented to the American Academy of Religion Annual Meeting, November, Atlanta.
- Polanyi, Michael. 1958. Personal Knowledge: Towards a Post-Critical Philosophy. Chicago: University of Chicago Press.
- Poteat, William H. 1985. Polanyian Meditations: In Search of a Post-Critical Logic. Durham: Duke University Press.
- . 1990. A Philosophical Daybook: Post-Critical Investigations. Columbia: University of Missouri Press.
- . 1994. Recovering the Ground: Critical Exercises in Recollection. Albany: State University of New York Press.
- Tillich, Paul. 1951. Systematic Theology, Vol. 1. Chicago: University of Chicago Press.
- Varela, Francisco and Evan Thompson and Eleanor Rosch. 1991. The Embodied Mind: Cognitive Science and Human Experience. Cambridge: MIT Press.
- Wittgenstein, Ludwig. 1958. Philosophical Investigations, trans. G. E. M. Anscombe. New York: Macmillan.